UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/500,305	06/28/2004	Robert William Clarke	608-423	9861

23117 7590 04/04/2007

NIXON & VANDERHYE, PC
901 NORTH GLEBE ROAD, 11TH FLOOR
ARLINGTON, VA 22203

EXAMINER	
PUTTLITZ, KARL J	
ART UNIT	PAPER NUMBER
1621	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/04/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/500,305	CLARKE ET AL.	
	Examiner	Art Unit	
	Karl J. Puttlitz	1621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 January 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *19-41* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *19-41* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

KARL PUTTLITZ
PATENT EXAMINER
3/29/2007

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

The objection to the specification is withdrawn in view of the amendmsnts to the specification adding a brief description of the drawing.

The rejection under section 112, second paragraph is withdrawn in view of the amendmtns clarifying that step (d) is preformed in a single distillation means.

The rejection under section 103 is maintained and repeated below. Applicant's remarks in connection with this ground of rejection are also addressed.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 19-41 remain rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. patent No. 6,143,921 to Karim et al. (Karim).

The rejected claims cover, inter alia, an integrated process for the production of an alkenyl carboxylate which process comprises the steps:

(a) contacting in an oxidation reaction zone a C.sub.2 to C.sub.4 alkane, a molecular oxygen-containing gas, optionally the corresponding alkene and optionally water, in the presence of at least one catalyst active for the oxidation of the alkane to

the corresponding alkene and carboxylic acid, to produce a first product stream comprising alkene, carboxylic acid and water;

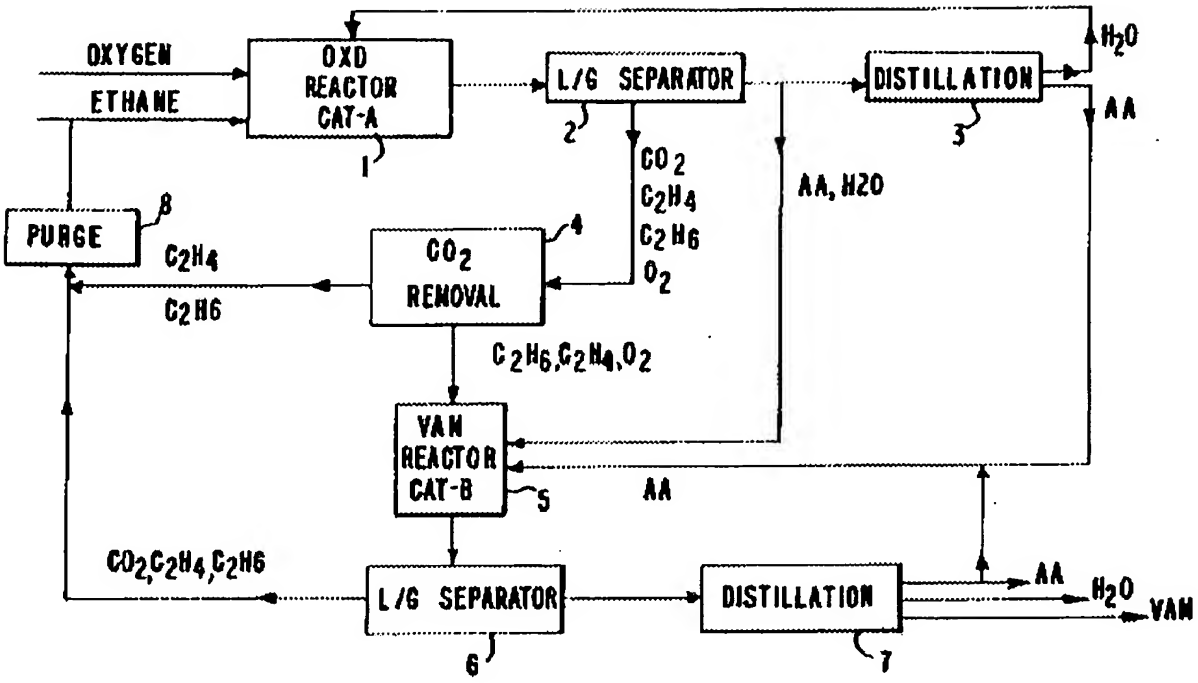
(b) separating at least a portion of the product stream from step (a) into a fraction comprising the alkene and a fraction comprising the carboxylic acid and water;

(c) contacting in a second reaction zone at least a portion of said alkene fraction produced in step (b), a carboxylic acid and a molecular oxygen-containing gas, in the presence of at least one catalyst active for the production of alkenyl carboxylate to produce a second product stream comprising alkenyl carboxylate, water and carboxylic acid;

(d) separating at least a portion of the product stream from step (c) and at least a portion of the carboxylic acid and water fraction produced in step (b) by azeotropic distillation into an overhead fraction comprising alkenyl carboxylate and a base fraction comprising carboxylic acid;

(e) recovering the alkenyl carboxylate from the overhead fraction separated in step (d). See claim 19.

With regard top the above process, Karim teaches a process for the preparation of vinyl acetate monomer with reference to the following figure1:



wherein a partial oxidation reactor 1 containing the first catalyst (CAT-A) converts fresh and recycled ethane or ethane/ethylene with oxygen into ethylene, acetic acid and carbon dioxide. An optimum amount of water from distillation reactor 3 is also introduced to partial oxidation reactor 1 in order to increase the acetic acid selectivity. The effluent from partial oxidation reactor 1 enters a gas/liquid separation unit 2. The gas stream from gas/liquid separation unit 2 is recycled to partial oxidation reactor 1 or goes to carbon dioxide absorption unit 4, where CO_2 is removed. The liquid stream from gas/liquid separation unit 2 goes to distillation unit 3, where acetic acid is separated from water or the liquid stream from gas/liquid separation unit 2 can directly go to VAM reactor 5 containing a conventional VAM catalyst (CAT-B). The treated gases consisting of ethane, ethylene and oxygen and the liquid stream consisting of acetic acid or acetic acid and water are fed to VAM reactor 5 to produce VAM, $CO_2$and unreacted ethane,

ethylene and acetic acid. The effluent of VAM reactor 5 is then fed to gas liquid separation unit 6 where gases including ethane, ethylene and CO_2 are separated, partially purged to control the build up of non reacting species in purge unit 8 and recycled back to partial oxidation reactor 1. The liquids are sent to distillation unit 7 for recovery of VAM. Acetic acid or unreacted acetic acid is recycled back to VAM reactor 5. See description bridging columns 5 and 6.

The difference between the process covered in the rejected claims and the process disclosed by Karim is that Karim fails to explicitly a separation step of separating at least a portion of the carboxylic acid and water fraction produced in step (b) by azeotropic distillation into an overhead fraction comprising alkenyl carboxylate and a base fraction comprising carboxylic acid. However, separation of a product stream to recover carboxylic acids is within the motivation of those of ordinary skill to recover valuable intermediates, such as acetic acid. Moreover, removal of products as either an overhead or base stream depends on the type of distillation used, and the components of the feed stream. Therefore, the rejected claims are prima facie obvious since Karim teaches the elements of these claims with a reasonable expectation of success.

Applicant argues that, in Karim, two distillation columns are employed, the acid and water stream from the oxidation reactor is fed to one distillation column and the vinyl acetate/acetic acid/water stream from the vinyl acetate reactor is fed to a second distillation column (see Fig. 1). Applicant concludes that there is no suggestion in Karim

which would motivate one of ordinary skill to combine the two distillation stages of Karim. Furthermore, the skilled person would have no expectation from Karim that a single distillation stage would enable the production of an improved vinyl acetate product.

However, it is quite clear for figure 1 of Karim that a portion of the acid/water stream from the liquid gas separator is not fed to the first distillation column, but is fed directly to the vinyl acetate reactor. In this regard, the claims do not require that this stream be feed directly to the second distillation column. But rather, the claims only require that the acid and water from this stream be separated in the second distillation column, which is shown in distillation column (7) in figure 1 of Karim.

With regard to the argument that the skilled person would have no expectation from Karim that a single distillation stage would enable the production of an improved vinyl acetate product, any difference in product between those of Karim and the instant invention cannot be attributed to the claimed steps, since Karim teaches these steps.

The double patenting rejection over US '380, US '697, US '563 and 10/505,660 are withdrawn since this patent fails to recite, inter alia, a separation step (b) or (d) of the instant invention.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karl J. Puttlitz whose telephone number is (571) 272-0645. The examiner can normally be reached on Monday to Friday from 9 a.m. to 5 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thurman K. Page, can be reached at telephone number (571) 272-0602. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KARL PUTTLITZ
PATENT EXAMINER

3/29/2007